National Institute of Standards & Technology

Certificate of Analysis

Standard Reference Material® 929a

Magnesium Gluconate

(Clinical Standard for Magnesium)

This Standard Reference Material (SRM) is certified for use as an assay standard for magnesium. It is intended primarily for use in the calibration and standardization of procedures employed in clinical analysis and for the routine critical evaluation of daily working standards used in these procedures. The material is magnesium gluconate dihydrate: $Mg(C_6H_{11}O_7)_2 \bullet 2H_2O$ and is supplied in a unit of 5 g.

Certified Magnesium Concentration: The magnesium concentration, expressed as a mass fraction percent on a dry mass basis (see "Drying Instructions"), is based on measurements using isotope dilution – inductively coupled plasma – mass spectrometry (ID-ICP-MS) [1].

Certified Magnesium Concentration and Uncertainty: 5.362 % ± 0.027 %

The uncertainty in the certified value is calculated as $U = ku_c$, where u_c is the combined standard uncertainty calculated according to the ISO and NIST Guides [2] and k is the coverage factor. The value of u_c is intended to represent, at the level of one standard deviation, the combined effect of uncertainty components associated with the measurement uncertainty and additional Type B uncertainties. The coverage factor is 2. The expanded uncertainty, $U = ku_c$, is defined as an interval estimated to have a level of confidence of 95 %.

Expiration of Certification: The certification of this SRM is valid within the measurement uncertainties specified, until **01 September 2025**, provided the SRM is handled and stored in accordance with the instructions given in this certificate (see "Instructions for Use"). The certification is nullified if the SRM is contaminated or modified.

Maintenance of Certification: NIST will monitor representative solutions from this SRM lot over the period of its certification. If substantive changes occur that affect the certification before the expiration of certification, NIST will notify the purchaser. Registration (see attached sheet) will facilitate notification.

Coordination of the technical measurements leading to the certification of SRM 929a was provided by K.E. Murphy and G.C. Turk of the NIST Analytical Chemistry Division.

The certification analyses were performed by K.E. Murphy and T.A. Butler of the NIST Analytical Chemistry Division.

The statistical evaluation of the data was performed by D.D. Leber of the NIST Statistical Engineering Division.

The support aspects involved in the issuance of this SRM were coordinated through the NIST Standard Reference Materials Program by C.S. Davis of the NIST Measurement Services Division.

Stephen A. Wise, Chief
Analytical Chemistry Division

Gaithersburg, MD 20899
Certificate Issue Date: 26 April 2005

Robert L. Watters, Jr., Chief
Measurement Services Division

The magnesium gluconate dihydrate used for this SRM was obtained from the Spectrum Laboratory Products, Inc. (Gardena, CA)[1].

NOTICE AND WARNINGS TO USERS

Stability of Prepared Solution: Solutions of SRM 929a prepared as instructed are stable for at least 60 days under normal laboratory conditions.

WARNING: This SRM is intended for "in vitro" diagnostic use only.

INSTRUCTIONS FOR USE

Storage: SRM 929a should be stored in the tightly closed, original bottle under normal laboratory conditions. Tests show this material to be hydroscopic and must be dried as directed before use; such drying will not remove water of hydration. Stored under these conditions, this material will show no significant change in properties.

Drying Instructions: This certified value is based on a minimum sample of 400 mg of the SRM dried to constant weight for at least 72 h over fresh anhydrous magnesium perchlorate. The certified value is based on the determination of magnesium in the *dried material*.

Use: A standard solution containing 5.00 mmol/L of magnesium may be prepared by placing 1.133 g of dried SRM 929a in a 500-mL volumetric flask and dissolving the material with laboratory reagent grade water.[(a)] Lower concentrations required for analysis may be prepared by accurate dilutions.

[(a)] Laboratory reagent grade water meeting any of the following specifications:

American Society for Testing and Materials (ASTM): D1193-Type II
College of American Pathologists (CAP): Type II
National Committee for Clinical Laboratory Standards (NCCLS): Type I

REFERENCES

[1] S.E. Long; K.E. Murphy; *Compilation of Higher-Order Methods for the Determination of Electrolytes in Clinical Materials*; NIST 260-162.

[2] ISO; *Guide to the Expression of Uncertainty in Measurement*; ISBN 92-67-10188-9, 1st ed.; International Organization for Standardization: Geneva, Switzerland (1993); see also Taylor, B.N.; Kuyatt, C.E.; *Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results*; NIST Technical Note 1297, U.S. Government Printing Office: Washington, DC (1994); available at http://physics.nist.gov/Pubs/.

Users of this SRM should ensure that the certificate in their possession is current. This can be accomplished by contacting the SRM Program at: telephone (301) 975-6776; fax (301) 926-4751; e-mail srminfo@nist.gov; or via the Internet at http://www.nist.gov/srm.

[1]Certain commercial equipment, instrumentation, or materials are identified in this certificate to specify adequately the experimental procedure. Such identification does not imply recommendation or endorsement by the NIST, nor does it imply that the materials or equipment identified are necessarily the best available for the purpose.